

University of Nebraska - Lincoln

**DigitalCommons@University of Nebraska - Lincoln**

---

Drought Mitigation Center Faculty Publications

Drought -- National Drought Mitigation Center

---

2014

# Changing the Paradigm for Drought Management: Can We Break the Hydro-Illogical Cycle?

Donald A. Wilhite

*University of Nebraska - Lincoln*, [dwilhite2@unl.edu](mailto:dwilhite2@unl.edu)

Follow this and additional works at: <http://digitalcommons.unl.edu/droughtfacpub>

---

Wilhite, Donald A., "Changing the Paradigm for Drought Management: Can We Break the Hydro-Illogical Cycle?" (2014). *Drought Mitigation Center Faculty Publications*. 54.

<http://digitalcommons.unl.edu/droughtfacpub/54>

This Article is brought to you for free and open access by the Drought -- National Drought Mitigation Center at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Drought Mitigation Center Faculty Publications by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Published in *Water Resources Impact* 16:1 (January 2014), pp. 21–23 (invited essay for the special issue *AWRA at 50: The Future for Water Resources in the United States*).  
Copyright © 2014 American Water Resources Association.

# Changing the Paradigm for Drought Management: Can We Break the Hydro-Illogical Cycle?

Donald A. Wilhite

School of Natural Resources, University of Nebraska–Lincoln, USA

*Correspondence information* – 811 Hardin Hall, 3310 Holdrege St., Lincoln, NE 68583, telephone 402-472-4270, email [dwilhite2@unl.edu](mailto:dwilhite2@unl.edu)

Drought knows no political boundaries. It affects all United States (U.S.) states and most regions of the world on a frequent basis, impacting many diverse sectors. Millions of people died in recent years from starvation in the Greater Horn of Africa, and drought was a significant causal factor in that event. Millions more are threatened in other regions of Africa and in other developing countries each year. Much of Australia recently experienced severe drought conditions for a decade. In some areas of the country, it was the worst drought of the last century. Northeast Brazil continues to experience the devastating effects of a drought that began in 2012. Texas experienced its worst drought in state history in 2011, and two-thirds of the U.S. experienced moderate to exceptional drought in 2012, with impacts exceeding \$35 billion. Drought has been pervasive throughout the western U.S. for the past decade and it appears to be becoming more frequent for this already water-stressed region. However, drought affects all portions of the U.S.; it is not just a feature of the climate of the western states. As of this writing, 46 percent of the nation is in moderate to exceptional drought conditions according to the U.S. Drought Monitor.

The problem, worldwide and on a national and local basis, is that we treat drought as an uncommon visitor when, in fact, it is a normal part of our climate. The instrumental record demonstrates that drought occurs somewhere in the U.S. each year, frequently affecting more than 40 percent of the nation and resulting in billions of dollars in economic, social, and environmental impacts. No region of the country is immune to the ravages of

drought, but for some areas it is far more common than not. Given its frequency, severity, and duration and the devastating impacts on a growing number of sectors, the future is now. We must consider alternatives for how we have managed and responded to drought historically. It is time for nations to build greater institutional capacity aimed at improving societal coping capacity and long-term resilience. While building resiliency begins with the individual and communities, it is also important for nations to have a framework in place that emphasizes self-reliance and drought risk reduction.

Greater attention is now being directed to reducing risks associated with drought occurrence through the introduction of risk-based policies and the development of preparedness plans to improve operational capabilities (i.e., climate and water supply monitoring, building institutional capacity) and mitigation measures that are aimed at reducing drought impacts. This change in emphasis is long overdue. Mitigating the effects of drought requires the use of all components of the cycle of disaster management rather than only the crisis management portion of this cycle. Typically, when drought occurs, governments and donors have followed with impact assessment, response, and recovery actions in an attempt to return the region or locality to a predisaster state. Historically, little attention has been given to the risk management elements of the cycle (i.e., preparedness, mitigation, and prediction/early warnings)—actions that can reduce risk and, therefore, impacts. Ultimately, these risk reduction practices will lessen the need for government and donor interventions in the future. A recent study by the Center for American Progress (Weiss et al., 2013) indicated that the U.S. federal government spent nearly \$62 billion for disaster relief in fiscal years 2011 and 2012. Most of this relief was directed to responding to the severe droughts that occurred in these years. This figure does not include the additional funding provided in response to Superstorm Sandy. The crisis management approach addresses only the symptoms of drought as they manifest themselves in the impacts that occur as a direct or indirect result of drought. Risk-based management, on the other hand, identifies where vulnerabilities exist—particular sectors, regions, communities, or population groups (i.e., who and what is at risk and why)—and addresses these vulnerabilities through systematically implementing mitigation measures that will lessen the risk to future drought events. Because societies have emphasized crisis management in past attempts at drought management, countries have generally moved from one drought-related disaster event to another with little, if any, reduction in risk. In addition, in many drought-prone regions, another drought event is likely to occur before the region fully recovers from the last event.

How governments and societies respond to drought (and other natural disasters) has become a topic of considerable debate in the past decade as governments and nongovernmental organizations continue to distribute increasing amounts of money and other forms of assistance to victims and sectors in both developing and developed countries. Studies have shown that drought or disaster relief does little to reduce societal vulnerability to the next event. It could even increase vulnerability because it encourages the status quo. In other words, vulnerability to drought is often the direct result of poor planning and resource management practices. If we are to reduce societal vulnerability, we need to encourage improved planning and resource management by redirecting resources from response programs to mitigation programs that target those people and sectors most at

risk. The challenge is to move governments away from simply responding to crises to a more proactive approach that identifies the populations, sectors, and regions most at risk and targets programs to those areas with the goal of reducing that risk. As stated previously, a risk-based approach can lead to increased institutional capacity and reduced impacts since risk-reduction policies and preparedness planning build resilience. This approach lessens the need for crisis-oriented government interventions, an approach I refer to as the “hydro-illogical” cycle. Globally, there are serious concerns about the spiraling impacts of drought on a growing number of sectors, especially given current increases in drought incidence for many regions and projected further increases in this extreme climatic event as a result of climate change (U.S. Global Change Research Program, 2013; Peterson et al., 2013; IPCC, 2012, 2013). These concerns have resulted in increased attention to the need for risk-based national drought policies and preparedness plans as the instruments to implement those policies. The need for a more proactive approach to drought management was a motivating factor that led the World Meteorological Organization’s (WMO) Congress at its Sixteenth Session (held in Geneva in 2011) to recommend the organization of a “High-level Meeting on National Drought Policy (HMNDP).” Accordingly, WMO, the Secretariat of the United Nations Convention to Combat Desertification (UNCCD), and the Food and Agriculture Organization of the United Nations (FAO), in collaboration with a number of United Nations (UN) agencies, international and regional organizations, and key national agencies, organized the HMNDP in Geneva on March 11–15, 2013 (<http://www.hmndp.org/>). The theme of HMNDP was “Reducing Societal Vulnerability—Helping Society (Communities and Sectors).” The goal of this meeting was to encourage all nations to adopt national drought policies that were focused on risk reduction by providing a framework for policy development and adoption. UN-Water has now joined with WMO, UNCCD, and FAO in offering training workshops on capacity development in support of national drought policies throughout the world.

Simply stated, a national drought policy will establish a clear set of principles or operating guidelines to govern the management of drought and its impacts. The overriding principle of drought policy is an emphasis on risk management through the application of preparedness and mitigation measures. This policy should be directed toward reducing risk by developing better awareness and understanding of the drought hazard and the underlying causes of societal vulnerability. The principles of risk management can be promoted by encouraging the improvement and application of seasonal and shorter-term forecasts, developing integrated monitoring and drought early warning systems and associated information delivery systems, developing preparedness plans at various levels of government, adopting mitigation actions and programs, promoting water conservation and supply augmentation strategies, creating a safety net of emergency response programs that ensure timely and targeted relief while supporting the principles of drought policies, and providing an organizational structure that enhances coordination within and between levels of government and with stakeholders. This policy must be consistent and equitable for all regions, population groups, and economic sectors and consistent with the goals of sustainable development.

Unfortunately, the U.S. has no cohesive national drought policy, a fact well demonstrated as the nation responded to the 2012 drought and other recent droughts. Following

the severe drought of 1996 that affected much of the southwestern and south central portions of the country, there were attempts to put in place a national drought policy. The U.S. Congress passed the National Drought Policy Act (Public Law 105-199) in 1998. The bill created the National Drought Policy Commission (NDPC) to “provide advice and recommendations on creation of an integrated, coordinated federal policy designed to prepare for and respond to serious drought emergencies.” The NDPC’s report, submitted to Congress and the President in May 2000, recommended that the U.S. establish a national drought policy that emphasized the principles of risk reduction through the implementation of more preparedness planning and the adoption of proactive mitigation measures, including public education and greater collaboration among scientists and public officials (National Drought Policy Commission, 2000).

The NDPC further recommended creation of a long-term, continuing National Drought Council composed of federal and nonfederal members to implement the recommendations of the Commission, including the development of an action plan to develop a risk-based national drought policy. The Commission further stated that “we can reduce this nation’s vulnerability to the impacts of drought by making preparedness the cornerstone of national drought policy” (National Drought Policy Commission, 2000). Little action on the NDPC’s recommendations has occurred since the report was submitted, except for passage of a bill by the U.S. Congress in 2006 creating the National Integrated Drought Information System (NIDIS) under the leadership of the National Oceanic and Atmospheric Administration (Public Law 109-430). This very successful program is up for reauthorization in 2013.

If the droughts of the last decade and those ongoing in the U.S. today and elsewhere teach us nothing else, they should at least teach us that all nations need to be better prepared for the inevitable future droughts and develop a national drought policy and a higher level of preparedness that emphasizes risk reduction as its overriding principle. In the case of the U.S., most states now have drought plans in place, some with a significant emphasis on risk reduction and mitigation. These state plans and the improved early warning and information delivery system provided by the NIDIS and its partners gives us a much stronger scientific foundation to support a national drought policy. It is now time for the federal government to act on the recommendations of the National Drought Policy Commission’s report and provide more leadership on this important resource management issue. Given concerns expressed in the IPCC reports (IPCC, 2012, 2013) and the U.S. National Climate Assessment report (U.S. Global Change Research Program, 2013) regarding the increased frequency, intensity, and duration of droughts in the future, as well as the role that population increases and demographic shifts play in influencing our vulnerability to drought, the economic, social, and environmental impacts of drought will likely continue to escalate. Nations must implement more effective drought management policies in order to reduce these impacts in the future.

**Donald A. Wilhite** is an internationally known climatologist and professor in the School of Natural Resources, University of Nebraska–Lincoln (UNL). He was the founding director of the National Drought Mitigation Center at UNL and previous director of the School of Natural Resources.

## References

- IPCC (Intergovernmental Panel on Climate Change), 2012. Summary for Policymakers. *In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*, C. B. Field, V. Barros, T. F. Stocker, D. Qin, D. J. Dokken, K. L. Ebi, M. D. Mastrandrea, K. J. Mach, G.-K. Plattner, S. K. Allen, M. Tignor, and P. M. Midgley (Editors). A Special Report of Working Groups I and II of the IPCC, University Press, Cambridge, United Kingdom and New York, New York, pp. 1–19.
- IPCC (Intergovernmental Panel on Climate Change), 2013. Working Group I Contribution to the IPCC Fifth Assessment Report. *Climate Change 2013: The Physical Science Basis (Summary for Policymakers)*. September.
- National Drought Policy Commission, 2000. *Preparing for Drought in the 21st Century*. U.S. Department of Agriculture. Washington, D.C. 60 pp.
- Peterson, T. C., P. A. Stott, and S. Herring, 2013. Explaining Extreme Events of 2012 from a Climate Perspective. *Bulletin of the American Meteorological Society* 94 (9):1–14.
- U.S. Global Change Research Program, 2013. Federal Advisory Committee National Climate Assessment Report (Draft). Washington, D.C., 1. 146 pp.
- Weiss, D. J., J. Weidman, and S. Pinkalla, 2013. *States of Denial: States with the Most Federal Disaster Aid Sent Climate-Science Deniers to Congress*. Center for American Progress.